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THE EFFECTS OF MENTAL RETARDATION ON FILM LEARNING.

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THE EFFECTS OF MENTAL RETARDATION UPON FILM-LEARNING ABILITY WAS INVESTIGATED. FILMS WHICH COVERED AREAS OF VOCATIONAL ORIENTATION, CONSUMER EDUCATION OR ECONOMICS, AND CIVICS, WERE PRODUCED. THE STUDY SAMPLE WAS MADE UP OF 402 SUBJECTS FROM 21 JUNIOR AND SENIOR HIGH SCHOOLS. THE AVERAGE AGE WAS 14 YEARS AND THE MEAN IQ, 68. PRE- AND POST-TESTS INCLUDED ORAL, INDIVIDUAL, AND VISUAL PROCEDURES. THE RESPONSES WERE RECORDED AND ANALYZED. THE RESULTS INDICATED THAT SPECIAL FILMS CAN BE EFFECTIVE AS A TEACHING METHOD FOR EDUCABLE MENTALLY RETARDED PUPILS. IT WAS SUGGESTED THAT FURTHER DEVELOPMENT INCLUDE "RECAPS" AND RECALLS. (RS)

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A Study to determine what Type of Instructional Film experiences are meaningful to children with Mental Retardation regularly enrolled in Public Schools

John P. Driscoll

Title VII Project Number 365
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BACKGROUND OF THE STUDY

Special education is a wide-spread and complex field of endeavor. It concerns itself with the understandings and techniques of teaching children of atypical physical or mental characteristics.

Much has been done by individual teachers and clinical workers in the field to devise that which we might call "special tools for special education." Teachers of the mentally retarded particularly have had to show initiative and imagination in this because publishers and producers of educational media have shown little interest to date in this field, probably due to the restricted market. This study aims at investigation of one medium, the motion picture, in one area of special education, teaching educable retarded children enrolled in the public schools.

In 1957 a study was undertaken by this investigator as a pilot project in ascertaining "if" retardates were capable of appreciable film learning.[1] As the results of that investigation were positive in nature, it follows that the present study concerns itself more with "how" children with mental retardation learn from films, and attempts to progress from and beyond those findings. The earlier work studied film learning and retention in some eleven classes, viewing five different types of educational film sequences. Results strongly indicated that the form and tempo of most educational films were improper for the retarded, and it was assumed that further serious study would have to be based on the production and use of special films.

This, then, is a study in design and construction of those "special films for special education," as well as a test and analysis of their effect.

As the investigator is a specialist in film and not in the education of the retarded, advice was sought from some 15 teachers and supervisors in that field. After consultation it was felt that the following three areas were the most fruitful for investigation, as well as currently lacking in acceptable product availability:

Vocational Orientation
Consumer Education or Economics
Civics

In that a better analysis of film-learning could be gained by utilizing several films of varied format and approach, it was decided

[1] See Driscoll, J., Research Bulletin of the Audio-visual Association of California, Summer, 1960, 2, Vol. 2.

that three sound films should be completed and tested in the allotted time and budget. In the original proposal the desire to investigate the potential success of the story, expository and animation approaches had been outlined and the three subjects listed above were assigned respectively, one to each medium.

Supporting the decision to make and test films in the subjects listed above was the awareness of the great difficulty met by teachers in preparing retarded children for the world they are to live in, including the acquisition of many abstract or semi-abstract concepts they will need to operate as members of the adult community. If indeed behavioral change is the goal of the educational process, it is obvious that attitudinal change and the ability to generalize concepts of social pattern and structure must premise any positive behavioral shift resulting from the educational experience. Films are one type of educational experience and they have been proven effective under certain conditions in both the conceptulization process and attitudinal change. Such proof to date applies almost entirely to audiences of average or above-average intelligence. But what of the audience made up of those school children handicapped by below-average mental ability?

Scientific evidence does exist showing a relationship between film-learning and general intelligence level. However, the pattern of results from various studies shows only a trend in one direction, i.e. positive correlation between the factors. Conversely, some studies have shown very low or no correlation between these. Smith found correlations of only .18 and .25 between I.Q. and test gains due to film viewings when comparing factual learning from demonstration and film viewing. (2) Wittich and Fowlkes found no significant difference between high and low I.Q. groups when film showings were repeated. (3) Studies by Wise (4), Hinman (5), and Secor (6) indicated greater film learning ability among higher intelligence groups. Several studies have proven that films tend to show a great-

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(2) H. A. Smith, **A determination of the Relative Effectiveness of Sound Motion Pictures and Equivalent Teacher Demonstrations in Ninth-Grade General Science,** (Unpublished thesis, Univ. Nebraska 1948).

(3) Wittich, W. & Fowlkes, J., **Audio-visual Paths to Learning,** New York: Harper & Co. 1946.

(4) Wise, H. A., **Motion Pictures as an Aid to Teaching American History,** New Haven: Yale University Press, 1939.

(5) Hinman, S. T., **The Value of Pre-knowledge of Tests in Stimulating Pupils to Observe and Retain Facts Presented in Motion Pictures,** Unpublished Thesis, New York University, 1931.

(6) Secor, C. T., **A Comparative Study of the Effectiveness of the Motion Picture followed by Oral Discussion and a Combination of the Lecture, Laboratory, and Recitation Methods of Teaching Certain Units High School Biology,** Unpublished Masters Thesis, New York University, 1931.

er gain for lower I.Q. pupils than for higher I.Q. pupils, but with the performance of the lower groups still not matching that of the higher groups. One study which specifically attempted to measure film learning of retarded children was marred by both incomplete statistics and a very small sample. Other recent studies have attempted correlating test performance and mental ability with moderately significant results. As none of these projects involved special films, they differ markedly from the present study.

Carter, Moss, and Wilson have lately completed a project aimed at determining the effectiveness of conventional teaching of a unit in Health and Safety relative to three different film techniques (varying according to learner participation required, and utilizing specially produced films). No significant differences were found between the various techniques, nor between the performance of "high-grade" and "low-grade" retardates.

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THE PROBLEM AND PROCEDURES

To investigate what effects mental retardation has upon film-learning ability, we must segregate that which we wish to learn from the vast amount of research on film learning already accomplished. We know films, when compared with conventional teaching techniques, tend to teach many things better, more permanently, and stimulate greater interest for most students. No attempt is made here to prove these items for this particular population. What we are asking concerns what constitutes a good film-learning experience for this particular audience. Does retardation eliminate common approaches to film communication, such as the story, animation, or direct exposition? Children with mental retardation necessarily learn in a different manner and at a different rate than normal children. Is it feasible they might learn best from films specially tailored to their pace and vocabulary, or should they be expected to absorb small portions of films created for normal students?

Epitomising the expectations involved in this project are the following questions, only part of which we can hope will be answered decisively in the limits of time and budget, but all of which need to be considered in pursuing the aims of the study. Regarding the film-learning characteristics or retarded children, we ask:

1. Does factual learning take place at a rate which merits the use of the film as a teaching tool?
2. Is their attention span such that they can learn only from a short film lesson?
3. Are they responsive to humor, story line, and visual-audio cueing?
4. Do they become personally involved in dramatic presentations or do they see only movement on the screen and fail to identify with characters in the film story?
5. Can their attitudes be changed appreciably?
6. Do they have the ability to generalize from visual presentations of abstract or semi-abstract material?
7. Is there a correlation between the mental ability of retardates and their performance in film learning?
8. What types of films teach them best?

Production goal:

Because the investigators were interested in developing materials specifically to fit the research design, rather than fitting the design to existing motion pictures, a great deal of the effort invested in this project went into the writing and production of the three forementioned films. The format of these films necessarily deviated from the usual

approach utilized in educational pictures. It was hoped that certain features built into the films could step-up their effectiveness.

The Films:

Help Wanted, the first film produced and tested, was a 28 minute story film, done in black and white photography, with sound track of narration, effects, and music. No dialogue was involved in the film, though conversations were referred to many times by the narrator. It was felt a greater chance of identification with the story's protagonist would occur if the narrator were an adolescent speaking in the first person and if the narration itself were simple, sparsely used, and at least partially in the contemporary adolescent vernacular. A glance at the film narration included in the appendix, will reveal its verbal level and fact density to be unorthodox for the secondary school film.

Musical background for this film was of the "canned type" and not chosen for particular emphasis, or cueing, with specific recurring veins or themes. It was expected to be neutral in character, balancing the sparsity of narrated message, and possibly sustaining interest in the visual. Sound effects were used but a few times, and placed in the film for aesthetic reasons only, although their presence later seemed to have helped in adding realism for this particular type of film-viewer.

The scenario of **Help Wanted** concerned the plight of a young man graduating from high school without knowing just how to go about looking for a job. After looking in the wrong places, he is finally referred to the State Employment Office and goes through the procedures of application, interview, and being hired. Unfortunately, a series of mistakes leads to his losing the job. Through a process of retrospection and introspection he arrives at a new opportunity which he is then better suited to appreciate and keep.

Our Economy, the second film produced for this research project, was a film made up primarily of stock shots of various commercial and industrial activities. It was expected to introduce the concepts of consumer demand, wholesale, and retail marketing, etc. As these concepts were certainly new in terminology and complexity to this particular audience it seemed best to limit their number and illustration. The need for economic orientation on the part of retarded secondary students is obvious, and it was hoped to ascertain in "pilot stage" just what might be significant to such students.

Government, the third film produced in this series concerned itself with the structure of American government. It was attempted to produce an interesting film about a traditionally dry subject. As the decision had been made to incorporate the appeal and

significance of animation techniques into the research design, an eight-minute color sound film of detailed animation was produced. The film was narrated in a style and at a rate commensurate with the mental age of secondary retardates, with emphasis on simplification and repetition. As the concept of government is indeed an abstract one, each idea introduced into the film, e.g. how government protects the citizens, was specially cued color and sound-wise. The musical score, composed for the film before it was itself made, attempted to relate the visual image with the significance of the narration by post-message cueing. Several sections of the film had no narration.

Testing the Films:

It should be clear to the reader by now that this is not a "comparative effectiveness" study, but rather a developmental study, aimed at checking the responsiveness of the mentally retarded child to film teaching, as well as the success of certain film techniques used in communicating with such children. Accordingly the research design was shaped not toward equating groups, random sampling, or the alignment of experimental and control groups, but instead toward pre-post test differentials and film learning characteristics discernible through oral testing techniques. Although a control group of normal children is mentioned in regards to one film, the remarks about it are not submitted as scientific evidence, but only as a gesture toward better understanding preferences on the part of viewers.

The population tested in this project involved children enrolled on a regular basis in the public schools of Los Angeles County. These children were in some 21 schools, both Junior and Senior high, and totaled 467. However, due to inadequate time or facilities for consistent testing, the total population measured in the study was only 402. The scores of students for whom there were incomplete records or who were unable to finish the testing program, were eliminated from the study.

Schools included in the study ranged from those in the highest to those in the lowest socio-economic groups of the Los Angeles area. White, Negro, and Mexican children took part in proportions approximating the racial make-up of the secondary school population of Los Angeles County. Regardless of the fact that specific random sampling of the school population was not attempted, it is expected that the population sample is quite representative of the universe of retardates now attending public schools in California, and not greatly unlike that in the entire United States.

The average chronological age of the subjects was 15 years, 10 months in the high school classes, 13 years, 2 months in the junior

high classes. Intelligence quotients from school records quickly reveal the discrepancy between average and special education students. By state law, a child in California public schools can be classified as retarded and placed in the Point I Program, as the set-up for retardates is labeled in California, only if his intelligence quotient falls below 85. As the mean intelligence quotient for high school students was 69.19 and for junior high 67.93, it is evident that chronological and mental ages differed markedly. We should note also that no class I.Q. score differed greatly from the mean, thus revealing a high degree of homogeniety in the mental abilities of the total population.

Testing children with mental retardation involves certain factors unique to that group. Whereas written examination questions for written responses can be administered to average and above average students, these methods would amount to a great hurdle for retarded children, yielding at the most a diagnosis of current reading and writing problems, rather than definite knowledge of visual alertness and teachability.

Working from this premise, it was deemed necessary to test all children involved orally and individually, weighting responses when necessary, but always avoiding putting the obstacle of the printed word between the child and his ability to tell what he had learned. Unfortunately for the investigator, oral testing on an individual basis required that more than 3,000 responses be recorded. The examination took the form of reading aloud the questions, thus allowing a standardized testing method, with only occasional elaboration necessary for very low students. Students were graded as "understands", "understands partially", or "does not understand" except in certain questions requesting a numerical or "yes" — "no" answer.

Leaders in the audio-visual field have for years talked of the advantages of visual testing. With the combination of an animation film and an audience of limited verbal ability, it seemed propitious to use such a method in part of this study. Ten animation cells used in the film **Government** were selected from the several thousand available after the picture had been shot. The student was asked what a certain picture meant to him, or who was represented in it. From his answer it was easy to quickly tabulate his understanding, or lack thereof. The pre-post portion of this particular film test was not included in the visual testing, in that the existing conceptions of governmental structure would in all probability be symbolized in a manner different from that utilized in the film.

RESULTS

Test results of the films involved in this study are presented below in table form. Schools are referred to in the tables by number.

Tables 1 through 9 are the pre-post test scores for the first film tested, **Help Wanted,** the 28 minute live-action story film. It will be noted that the tabulation is horizontal in nature, allowing for consideration of the response of each class to a specific interrogation, as well as the response of the total population.

Significance of the various scores is indicated by the Chi-square (X^2) values provided for each question, and for the total pre-post test.

TABLE 1

First Question

		PRE			POST		
Class	N	M	W	R	M	W	R
School 1	14	4	8	2	3	2	9
School 2	25	6	7	12	0	1	24
School 3	23	6	15	2	4	4	15
School 4	13	2	11	0	2	4	7
School 5	14	7	3	4	1	4	9
School 6	28	0	12	16	11	1	16
School 7	25	0	11	14	3	4	18
School 8	19	12	0	7	2	3	14
School 9	12	10	1	1	5	2	5
School 10	48	10	35	13	0	3	45
TOTAL	221	47	103	71	31	28	162

Chi-Square Value for Total 81.76

Note : "M" signifies maybe, or partially understands.
"W" signifies wrong or does not understand.
"R" signifies right or understands.

TABLE 2

Second Question

Class		PRE N	PRE M	PRE W	PRE R	POST M	POST W	POST R
School	1	14	7	4	3	7	3	4
School	2	25	15	2	8	21	2	2
School	3	23	14	4	5	4	1	18
School	4	13	2	5	6	1	0	12
School	5	14	7	1	6	1	1	12
School	6	28	18	3	7	18	3	7
School	7	25	5	15	5	2	14	9
School	8	19	3	14	2	2	2	15
School	9	12	10	1	1	5	2	5
School	10	48	20	23	5	35	3	10
TOTAL		221	101	72	48	96	31	94

Chi-Square Value for Total 31.35

TABLE 3

Third Question

Class		PRE N	PRE M	PRE W	PRE R	POST M	POST W	POST R
School	1	14	1	11	2	0	1	13
School	2	25	3	3	19	2	3	20
School	3	23	5	3	15	3	2	18
School	4	13	2	5	6	1	0	12
School	5	14	7	1	6	1	1	12
School	6	28	1	4	23	3	0	25
School	7	25	0	4	21	3	1	21
School	8	19	1	10	8	3	0	16
School	9	12	5	5	2	1	0	11
School	10	48	0	38	10	0	1	47
TOTAL		221	25	84	112	17	9	195

Chi-Square for Total 84.45

"M" signifies 1 or 2 items (understands maybe)
"W" signifies no items (does not understand)
"R" signifies 3 or more items (understands)

TABLE 4

Fourth Question

Class		N	PRE B	PRE C	PRE A	POST B	POST C	POST A
School	1	14	1	11	2	2	1	11
School	2	25	13		12	9	4	15
School	3	23	13	6	4	4	3	16
School	4	13	10	3	0	3	0	10
School	5	14	16	3	5	1	0	13
School	6	28	18	6	3	5	0	22
School	7	25	6	18	1	10	0	15
School	8	19	13	6	0	7	0	11
School	9	12	7	4	1	2	0	10
School	10	48	3	32	13	0	1	47
TOTAL		221	90	89	42	41	9	171

Chi-Square Value for Total 161.76

TABLE 5

Fifth Question

Class		N	PRE M	PRE W	PRE R	POST M	POST W	POST R
School	1	14	6	8	0	3	2	9
School	2	25	9		16	11	2	12
School	3	23	12	6	5		2	21
School	4	13	6	4	3	2	1	10
School	5	14	6	3	5	2		12
School	6	28	4	23	1	14	1	13
School	7	25	6	17	2	5	1	19
School	8	19	2	17	1	7	0	12
School	9	12	9	2	1	2	0	10
School	10	48	0	35	13	0	4	44
TOTAL		221	60	114	47	46	13	162

Chi-Square Value for Total 145.45

TABLE 6

Sixth Question

Classs		N	PRE M	PRE W	PRE R	POST M	POST W	POST R
School	1	14	3	7	4	2	1	11
School	2	25	8	0	17	2	2	21
School	3	23	10	5	8	5	2	16
School	4	13	5	3	5	1	0	12
School	5	14	1	6	7	4	0	10
School	6	28	1	2	25	2	0	25
School	7	25	2	9	14	4	0	21
School	8	19	0	1	18	0	1	18
School	9	12	7	3	2	2	0	10
School	10	48	21	5	22	5	6	37
Total		221	58	41	122	27	12	182

Chi Square Value for Total 39.02

TABLE 7

Seven Question

Classs		N	PRE M	PRE W	PRE R	POST M	POST W	POST R
School	1	14	6	8	0	2	2	10
School	2	25	3	1	21	1	3	21
School	3	23	3	7	13	1	2	20
School	4	13	2	3	8	3	0	10
School	5	14	3	6	5	0	0	14
School	6	28	12	7	9	6	0	22
School	7	25	5	5	15	6	4	15
School	8	19	12	7	0	7	0	12
School	9	12	5	4	3	0	0	12
School	10	48	4	30	14	5	0	43
Total		221	53	78	90	26	13	182

Chi Square Value for Total 86.77

TABLE 8

Eighth Question

Classs		N	PRE M	PRE W	PRE R	POST M	POST W	POST R
School	1	14	5	4	5	5	0	9
School	2	25	3	0	22	1	1	23
School	3	23	5	14	4	3	7	13
School	4	13	2	6	5	0	3	10
School	5	14	0	11	3	5	0	9
School	6	28	6	2	20	5	1	22
School	7	25	17	1	7	3	1	2
School	8	19	9	3	7	6	3	10
School	9	12	4	5	3	2	2	8
School	10	48	10	30	8	0	5	43
Total		221	61	76	84	30	23	168

Chi Square Value for Total 66.93

The average Chi-square for the entire pre-post test worked out at 79.91, which, like all of the component values, was highly significant.

As a measure of determining limits of assumed sampling error, the regular formula for the standard error of a proportion was was applied to each of the eight questions. The results, together with the average standard error are reported in Table IX.

TABLE 9

		% Increase	Lower Limit	Upper Limit
Question	1	.41	.32	.50
Question	2	.21	.14	.28
Question	3	.38	.30	.46
Question	4	.58	.49	.67
Question	5	.52	.43	.61
Question	6	.27	.19	.35
Question	7	.42	.33	.51
Question	8	.38	.30	.46
Average		.40	.31	.49

FACTUAL LEARNING:

Evidence is strong that learning of factual material can be readily accomplished via the motion picture. In the case of retarded children, such is not confined to familiar areas of previously learned material. Although the films tested in this study were not of a completely foreign nature, many facts therein were new, as shown in the differences between pre and post tests.

In the film **Help Wanted** question 1, 2, 3, and 6 can be classified as testing factual learning. To the question "What are references ?", 71 students were able to answer correctly in the pre-test, as contrasted to 162 in the post. This is clearly a significant change, although there seemed an inconsistent spread of knowledge about the job-getting process. To the question "Where would you look for a job ?' students changing to the right answer in the post test were only 38%. As this question aimed at ascertaining the effectiveness of the film in demonstrating the best, rather than the only source, the closer scores were to be expected. To the question "What goes on a job application form ?" answers were weighted according to the number of items a student could mention as making up the form. If a student had no idea of what goes on such a form, his answer was counted wrong; if he could suggest only one or two items, e.g. name, age, experience, etc., his answer was scored as "maybe", but if he could suggest more than two items and seemed to understand the concept involved, his answer was counted right. The pre-post differential, yielding a Chi-square value of 84.45 at 2 degrees of freedom, is significant at the .001 level.

Question number 6, "What are safety rules" was not well chosen, in that the amount of general conditioning for safety gave the high pre-test frequency of 122 correct answers, yielding a differential with the post-test of only 60. Thus in the film **Help Wanted** significant pre-post differentials, with high Chi-square values, all of which apply at the .001 level, indicate that factual learning via the film is clearly possible for retardates, and that such learning can be accomplished via the "story film".

The film **Our Economy** also demonstrated factual learning as quite feasible for retardates viewing films. This is especially evident to us when we realize the complexity of the concepts used in this film message, and their abstract nature. Few children of any intelligence range have as part of their vocabulary during Junior High School years such terms as "goods and services," or "wholesale buying." Yet from this film, these and many other terms were learned by

children with mental retardation, although such were obviously far beyond their range of experience. The nature of the film, which was brief and directly expository, did not allow for strong re-inforcement in either the body of the film or its recapitulation, and it is not supposed that the factual knowledge gained would be permanent. Rather, the object was to attempt semi-rote learning of terms illustrated by familiar visual cues. The film test included an answer catagory for those students who seemed able to tell the visual action only, without comprehending the meaning. The test was built around the comparison of single and repeated showings. A number of teachers of retardates have indicated success in repeated film showings and evidence in the frequency table below confirms this.

TABLE 10

Frequency of choices on 6 question test

Showing	N	Correct	Maybe	Visual Only	Wrong
First Showing	20	28	36	15	41
Second Showing	20	64	26	18	12

With three degrees of freedom the 16.26 Chi-square value obtained would be exceed significance at the .001 level. This demonstrates that factual learning tasks for films might well include repeated showings with this particular audience.

A question of a factual nature involved in the pre-post test on the film **Government** was "Where is the government ?" The pre-test yielded 47 acceptable answers, with 142 on the post-tests. Chi-square was 10.82.

ATTITUDINAL LEARNING

In the film **Help Wanted** attitudinal change was measured by questions 4, 5, 7, and 8 of the pre and post tests. Although measuring attitudinal change is always less accurate than measuring factual learning, there seems to be considerable evidence that significant change did occur as a result of viewing this film.

Question number 4, "What things are important to the man that hires you" yielded a pre-post difference of 129, using a weighting system to evaluate the number and quality of responses, with three or more suggestions being counted as the right answer. Prior

conditioning is indicated in the high pre-test score, but answers indicated a high comprehension of the story point demonstrating how to approach the job interview.

Question number 5, "Why should you get to work on time?", was designed to test the story point showing the importance of dependability, and yielded a pre-post differential of 115 in change to right answer.

In the case of question number 7 the weighting system gave highest credit for following the story point demonstrating the need for punctuality, "maybe" for giving a relevant response, and "wrong" for no response. The change was from 90 to 182 in those giving the right answer.

Question number 8, "What kind of an employment office would you go to in order to find a job?" showed a change from 84 to 168.

All of the above differences yielded Chi-squares significant at the .001% level.

In the area of attitudinal change, the film **Government** was proven effective in regard to one rather indicative question "What is the government?" As almost all of the children had some explanation to make in response during the pre-test, it is safe to assume that some existing concept was acted upon by the basic point made and re-inforced several times during the film. This point expressed the idea that "government is people working together", and was introduced to overcome the all too familiar childhood concept of government as a sort of "thing-somewhere." The number of children able to make a reasonable explanation of "the government" before seeing the film (27) was significantly smaller than that able to do so after (151). With a Chi-square of 161, it is obvious that this film challenges the commonly held hypothesis that a single film experience cannot change the attitude of retardates: abstract as it was, the concept was definitely enlarged from the "thing - somewhere" to some realization that people are the masters and makers of governments.

BASIC FILM LEARNING

In this category questions concerning the film **Help Wanted** were asked only after viewing the film, thus allowing no pre-post differential. However, all three questions clearly test for ability to follow the story line and discern lessons therefrom. To the question "What happened to the boy in the film after he lost his job"? the number of students giving the right answer was 184 compared to 20 giving the incorrect answer, and 17 giving a relevant but less acceptable answer.

In answering question number 10, "What did you learn about keeping a job from seeing this film." 53% of the students could name three or more acceptable items, 34% could mention two, and only 13% were unable to give two or more. These figures indicate some ability to generalize from the particular events in the film story.

Question number 11, "What would happen if you were late to work ?" was aimed at checking the concept of responsibility for appearing dependable, an extremely important factor in the working lives of retardates : 73% of the children answered they would explain immediately to the boss why they had been delayed, as did the boy in the film.

Analysis of the above responses implies that mental retardation is no deterent to following a relatively sophisticated story line, or deriving from such a story acceptable behavior patterns, although it is readily admitted that an oral test is hardly an accurate measure of behavioral change. One of the things which might have contributed to the film learning in this case was the credability of the story. All groups viewing the film were asked if they thought it was or could be a true story. Over 91% vouched it could be.

Basic film learning in the use of the picture **Government** was measured and analyzed in a different way than in the other films. Employing the visual test made up of displaying selected animation cells used in the picture, and asking standardized questions to each child after the screening was the technique utilized, rather than pre-post measurement. The film was shown to 165 pupils in eight different schools. Here is the list of cells and the respective accompanying question :

1. Dome of capitol building.
   (What does this mean ?)

2. Map of the United States.
   (What is this ?)

3. Cell showing policeman helping boy.
   (What's happening here and what has it to do with government ?)

4. Fireman putting out fire in house.
   (What has this to do with government ?)

5. Cell showing dogcatcher protecting small child.
   (And this ?)

6. Cell showing close-up of a state governor.
(Who is this ?)

7. Government workers.
(Who are those people ?)

8. People standing in line to pay taxes.
(What's happening here ?)

9. Candidates campaigning for office. .
(What's happening in this picture ?)

10. Cell showing people voting at booth.
(What's happening here ?)

The test results of three of the above questions are reported below :

TABLE 11

	Understands	Understands Partially	Does Not Understand	Total
Question 3	74	52	39	221
Question 7	119	31	15	221
Question 1	89	51	25	221

Concerning the ability of the population tested to understand concepts expressed in films, we can observe the ratio of those who understood or partially understood what the film was trying to teach, that one of the responsibilities of the government is to "protect people". The "understands partially" catagory was made up largely of children who could only relate the event in the story indicated by the cell of the policeman aiding the child. In other words, their comprehension was limited to visual action.

Questions 8 and 9 in this test were also designed to check the ability of the retarded to conceptualize from visual stimuli. The eighth cell shown the students was selected to recall the taxpaying sequence of the film, which explained how government is financed by the citizenry. The ninth cell illustrated two rival political candidates (one bald and one with a large shock of hair, incidentally,) attempting to urge voters to support their parties. The ratio of understanding implies that the animation employed was successful in teaching relatively complicated concepts to such children.

CONCLUSIONS

The purpose of this study, as stated earlier, has been to find what effect mental retardation has on film learning abilities of school children. To do so, it seemed both necessary and wise to create several films specifically for the needs of the study. Three such films were written and made with special attention to fact-density, pacing, and format, and then tested to discern their effect in teaching certain facts and concepts. From this, it was expected, could be generalized what will work and what will not work in film-teaching to children of below average mental ability. It is not supposed that this study answers the problem completely, but the results clearly indicate a number of factors which might well guide producers of films for special education, as well as those in the field engaged in using films.

The design of the first film, **Help Wanted,** included several factors applying to the first question of those postulated as aims of the project, which concerned factual learning. The Chi-square values show that learning facts was readily accomplished by retardates from a single viewing experience. None of the facts could be considered complex and all were dramatized, as well as reiterated by the narrator. In the film **Our Economy** an attempt was made to teach facts of a complex nature, outside and beyond the experience of the class, and without attempting to check the depth of understanding or the ability to generalize from the facts learned. Results, which did not include pre-test scores, showed considerable ability to learn in rote style, an ironically familiar learning method for children with mental retardation. Also, repeated showings were demonstrated significantly advantageous in the case of this film.

A general assumption about the short attention-span of retardates definitely does not apply to films of the type employed in this study. Both **Our Economy** and **Government** held interest, as would be expected for short films. The surprising fact discovered by this investigation was that an interesting and rather lively color animation film held interest no more than a black and white non-animation film of three times the length. The questions in the post-test on **Help Wanted** revealed an almost unanimous alertness to detail in the last few minutes of the film. This bore out suspicions aroused during the many showings of the film, in which interest seemed to be strongly sustained.

All of this is beside that fact that the film would be considered slow and repetitious by the average audience.

This leads to the third question posed, "Are they responsive to humor, story-line, and audio-visual cues." We can safely assume from what has been reported about the **Help Wanted** film that a story film is a very successful vehicle with this particular audience. Humor, on the other hand, did not seem as important as had been assumed it might be. Little evidence turned up during the screenings which might lead one to believe that the audience was learning better, more alert, or paying greater attention when or because elements of humor entered. Audio and visual cueing in the film **Government** was profuse and well-done, due mainly to the talents of the score's composer. Yet in every screening, when the children were asked if there had been music, the majority could not remember. As screen background music is meant to be felt, not remembered, most film producers would accordingly commend the composer. Sound cueing in the film **Help Wanted** was successful in adding realism and believability to the machinery scenes. Most children, when asked about the sound in the film remarked about the noises of the machines, but were again oblivious to the music track.

In both the **Government** and **Help Wanted** pictures, reaction to dramatic presentation showed personal involvement on the part of the adolescent audience. Assumptions made about the sixteen year cut-off point in adolescent involvement must be rejected for the retarded. In the latter film great empathy for the hero was incurred by most students: this empathy seemed just as strong in the 17 and 18 year-old students as in the younger.

The ability of these particular films to change attitudes was only moderately successful in the eyes of the investigator, although pre-post scores on questions from the two films discussed yielded highly significant Chi-square values, class discussion revealed elements of unreliability in the questions due to earlier indoctrination by teachers of several of the classes which had been working on units about employment procedures and how to keep a job. Conversely, it is symptomatic of the retarded to quickly accept and repeat ideas which might be easily capsulized in a brief slogan. Repeating an idea strongly emphasized by teacher or film narrator does not make that idea necessarily effective on future behavior. This suggests that some future study might better investigate film persuasiveness by devising appropriate measures of behavioral change, as the present study, which lacks such measures, clearly shows that retardates "say" their attitudes have been changed by the film experience.

It should be pointed out that the variety of backgrounds which children bring to school strongly affects their responses. One little boy, for example, when asked what he had learned about keeping a job said "Don't come to work drunk." In answer to the question "What is important to the man that hires you", he again referred to the practice of not being drunk.

Another boy thought the most likely reason one would be fired was "singing on the job". Another said "Don't fool around with girls." Maybe this only proved he had gained a certain amount of wisdom from the scene in the film where the protagonist misses the bus while talking to a young lady.

Do retarded children have the ability to generalize from visual presentations of abstract or semi-abstract material ? If one can accept as evidence the post-test results on the films **Government** and **Help Wanted,** it could be said the study has investigated this particular question. Concepts of protection, responsibility, alertness, and the need for government seemed to be clearly discernible in the students thinking after seeing the films. Lacking nevertheless, is an accurate measure of the ability to apply these generalizations, if indeed, they were truly formed. Perhaps the children are only prompting, teacher-pleasing, or being superficially comprehensive. One child, for instance, appeared to understand most of the concepts in the film on government, but when asked informally what the President does, stated "He takes phone calls." (Answering the phone was precisely what the busy Chief Executive was doing in the film sequence.)

In trying to correlate intelligence with film learning, scores on the post-test for the film **Government** were withdrawn for 30 randomly selected students of I.Q. rating below 68, and 30 randomly selected students of I.Q. above 68. The mean I.Q. of the low group was 58.76, the high group 73.13. Neither of the groups produced a coefficent of correlation significant at even the 5% level of confidence. It is assumed by the investigator that the particular visual testing involved was inadequate for correlation.

For purposes of comparison of reactions to this film, a control group of average and slightly above average children of similar chronological age to the subjects of the study was shown the film and asked to respond to the same questions, as well as write a few lines about the effectiveness of the film. In the pre-test alone the difference in ability to define and explain government was of course grave. Before seeing the film, some children were able to offer such explan-

ations as "Government is a form of jurisdiction over a people by a code of laws." The reaction to the visual post-testing was about 97% correct answers. Of interest to the people working on the film itself was a general strongly positive reaction to the film as a review lesson.

Considerable information about how students learned from the films was gained by taking notes during the film showing, as well as asking extra questions to students at random. One fact about intelligence which might be noted here is that students of obviously very low mental ability were almost always those who were able to relate only the visual action seen on the screen.

Attempting to answer the final question "What types of films best teach retarded children?" we must premise our answer with the fact that not all types of educational films were created or tested in this study. However, a number of catagorical values might be set up from the experience encountered in the pursuit of the project's goals. The story film seems a very successful medium for teaching children with mental retardation. The results of the study confirm that which conversations with many retarded children had indicated about their reactions to television. Stories, and very often the morals behind them, seem to stick in their minds.

Back and white holds the attention just as well as color, depending of course on the content of the film. A long film can be as effective as a shorter film, if personal involvement in the scenario occurs on the part of the audience. Animation films, although effective, do not appear superior to live photography, and it is highly probable complex animation is unnecessary and unwise in the economic sense. Highly simplified animation should be looked into as a possible medium for such children, perhaps without the seeming advantage and extra cost of color. One class was asked how they thought animation compared with live-action photography. About three-quarters favored learning from animation type films. One child remarked "A cartoon actually shows you what it is all about. A cartoon takes you right to the scene. You have to wait for people to do something."

In conclusion it can be vouched that special films for special education can be worked out, produced economically, and used effectively. It is feasible existing regular films might be modified for special education, but those making efforts thereto should consider carefully the film-learning characteristics of the particular audience.

Scripts of films for slow audiences might well include an extra dose of what scenario writers entitle the "recap," that portion at the end of the film which recalls for the audience the salient points made

during the process of seeing the film. It is quite likely that either a double or repeated "recap" might accomplish this, or better yet might sequential " recaps, " which periodically re-inforce the learning during the film.

It is hoped this study has shown a few of the ways in which the handicapped child might be helped to learn. Summing up his reaction to learning from motion pictures one pupil remarked: "I didn't understand some of the talking, but I understood the pictures."

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APPENDIX I

Sample of Simplified Vernacular

Narration from the film HELP WANTED

Last June, just before school was out for the summer, my Buddy, Don, and I were heading one morning for English class.

Like usual, we were sort of behind schedule and when we finally got in the room Mr. Wilson was already talking — about ways to apply for a job, or sumpin like that.

Guess I wasn't too interested although Don — he does better than me in school — tried to tell me I should be paying attention.

But then, who pays attention anyhow when the teacher's just talking about making out application forms and that sort of junk.

Even though I tried I couldn't seem to get much of a bang out of what Mr. Wilson was talking about : my mind kept wandering to things like that motorcycle I'd been looking at, and when that darned bell was gonna finally ring. Besides I could figure all this "gas" out later.